Modeling Initiatives at HHS

Update to the Secretary's Council

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- **Smallpox**
- **SARS**
- **Anthrax**

- **Working Groups of Secretary's Council**
- **Chair: Dr. Jim Chin**
- **Involvement of NIH (Dr. Ellis McKenzie, Dr. Joel Breman, Dr. George Curlin), CDC (Dr. Larry Anderson, Dr. Arnold Kaufmann, Dr. Richard Besser, Dr. John Glasser), and others (E.g. Dr. Friedlander, Dr. Grenfell)**
- **Purpose: Attempt to answer critical questions to guide policy development; examine a range of policy options related to preparedness and response**

Smallpox

- **Modelers are about to complete first phase, which models two relatively small smallpox outbreaks**
  - **Surveillance & Containment strategy appears to be effective**

	Emory	Hopkins/ Brookings	CDC
Control (10 cases / 5-6,000 persons)	5,650	5,474	1,046
Surveillance & Containment	4	140	5

Control (500 cases / 48-50,000 persons)	44,789	46,644	27,306
Surveillance & Containment	219	4,472	855

  - Reasons for quantitative divergence being examined
  - Under what conditions would S&C strategy not work?
- Plan is to publish results in peer-reviewed literature
- Next meeting scheduled for Jan 28-29
  - Larger smallpox outbreak: 10,000 cases from an aerosol release in a sports arena occurring in a city of 1.6 million people

SARS

- **Working group's first meeting is being scheduled**
- **Invited a modeler from Canada, Dr. David Earn, McMaster University**
- **CDC involvement to assist with best available data**

Anthrax

- **Working Group first met October 2-3, 2003**
- **To assess how effective our current response would be in a moderate to large scale bioterrorist attack employing anthrax**
- **To assess the impact of pre-vaccination on the number of casualties**

Anthrax Models

- **Scenarios developed by Sandia National Laboratories in 2000**
  - **Explosive Release Atmospheric Diffusion / Automated Consequence Report for Insidious Dispersal (ERAD/ACRID)**
- **Give casualty estimates for hypothetical terrorist attacks in a large metropolitan city**

Critical Factors

- Incubation period
- Antibiotic adherence
- Time to outbreak detection
- Hospital and emergency resources
- Duration of time to distribute antibiotics
- Antibiotic efficacy
- Characteristics of the vaccine
- Availability of antibiotics, AVA, and medical care capacity

Assumptions

- **Probability = 1**
- **2 scenarios**

	Exposed	Infected
Wet-fill	328,484	13,208
Dry-fill	1,391,886	82,765

- **Policy Options**
  - **PEP with antibiotics x 60 days +/- AVA at 0, 2, and 4 weeks**
  - **PEP with AVA at 0, 2, and 4 weeks + antibiotics for 10 days beyond completion of AVA series**
  - **Effect of population pre-immunization**
    - **In combination with the above options; no antibiotics; 30 days of antibiotics**

Pilot Models

- To predict cases based on
  - When antibiotics begin
  - How long it takes to distribute antibiotics
  - How long exposed persons adhere to antibiotics and when vaccination protection begins
  - Pre-exposure immunity
  - The effect of worried-wells
- Results to be discussed in March meeting

- **Chair: Dr. James Chin**
- **Coordination and expertise: Dr. Ellis McKenzie (Fogarty Center/NIH)**
- **Modelers:**
  - **Josh Epstein/Don Burke (Brookings/Hopkins)**
  - **Ira Longini/Betz Halloran (Emory)**
  - **John Glasser (CDC)**
  - **Ron Brookmeyer (Hopkins)**
  - **Michael Boechler (IEM Software)**
  - **Larry Wein (Stanford)**
  - **Nathaniel Hupert (Cornell)**